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ABSTRACT

The learning and communication styles of front-line literacy workers and supervisors at two national industrial sites served by a national workplace literacy grant were examined to determine whether the front-line workers' learning styles differed from those of their supervisors. A learning styles inventory developed by the Center for Innovative Teaching Techniques of the Wichita Public School system in Kansas was administered to the 195 employees in the study population. Of those individuals, 74% were hourly workers, 26% were managers, 77% were male, and 38% were members of minority groups. Fewer than 10% of the front-line workers had any postsecondary education, whereas more than 50% of the managers had a college degree and more than 10% had attended college for at least 1 year. Of the managers, 73% proved to be individual learners and 62% were characterized as written-expressive learners. Of the front-line workers, 58% were determined to be group learners, 68% were characterized as oral-expressive learners, and 54% were determined to have an auditory/visual/kinesthetic learning style. It was concluded that learners' failures in workplace literacy programs may have more to do with how learners are taught than with their perceived learning deficiencies. (MN)

Learning Styles Inventories:
What Can They Tell Us About Developing Workplace Literacy Programs?

A research project to determine if front-line workers have a predominant learning and communication style; and, if so, is it different from the styles of managers?

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Learning Styles Inventories

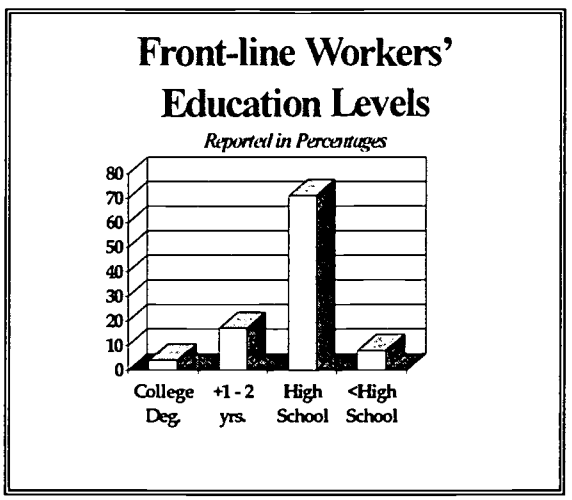
What Can They Tell Us About Developing Workplace Literacy Programs?

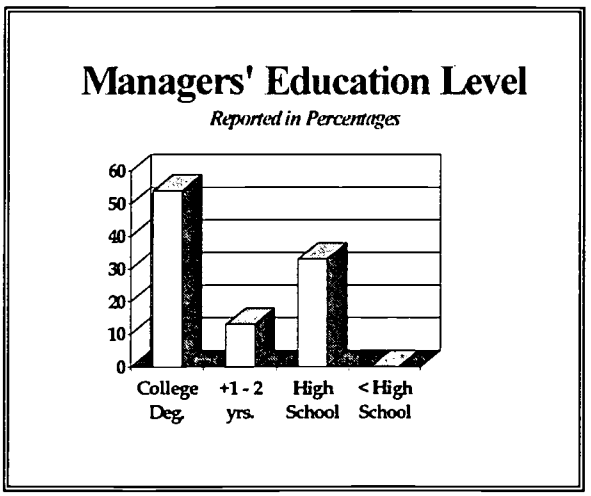
What: A study to determine if front-line workers have a predominant learning and communications style. The study involved determining the learning and communication styles of workers at two industrial sites served by a national workplace literacy grant. The grant staff also wanted to know if learning styles of front-line workers differed from those of supervisors, most of whom had attained post-secondary degrees.

Why: To determine if certain learning styles are predominant in the workplace, so that the appropriate learning strategies for those styles can be utilized in workplace learning classes, to improve workplace communication at the plant sites, and to assist in recruiting efforts for classes.

Administration: This study was conducted on-site by the workplace literacy staff from the local technical college which had received a US Department of Education National Workplace Literacy Grant. The study involved giving the C.I.T.E. (a learning styles inventory developed by the Center for Innovative Teaching Techniques, Wichita Public Schools, Wichita, Kansas).

Population: One hundred and ninety-five (195) employees were given the survey. Of this group, 74% were hourly workers, 26% managers, 77% male, 23% female, 62% non-minority & 38% minority. The educational levels of the front-line workers and supervisors/managers are represented in the following graphs.





Participants in the study were solicited from ongoing classes being conducted at the plant site by the national workplace grant staff, from work groups/departments who wanted to improve communication, from management teams, and from other employees who expressed an interest in knowing more about themselves.

Research: *Learning styles* can be defined as characteristic cognitive, affective, and psychological behaviors that serve as relatively stable indicators of how learners perceive, interact with and respond to the learning environment (Keefe, 1979). The *Learning Styles Network Newsletter* (Winter, 1980) describes learning style as the manner in which many different elements from five basic stimuli affect a person's ability to absorb and retain. The five broad categories are: Environmental, Emotional, Psychological, Physical, and Sociological. Physical stimuli--auditory, visual, and kinesthetic-- have to do with instructional preferences. In the general population, 30% are visual, 25% are auditory, and 15% are kinesthetic. The remaining 30% are of mixed modality (Barbe and Milone, 1991). As we age, our modalities can change from kinesthetic to visual to auditory (Keefe, 1987). The American educational system has long relied on a model of human intelligence that recognizes almost exclusively linguistic and

logical/mathematical capacities. Instructional methodology is usually teacher-centered, focused on transmitting information, with a heavy reliance on standardized testing. (Presentation from *Integrated Learning: Multiple Gateways for Lifetime Learning*). In research conducted by Hanson Silver and Associates on curriculum, it was discovered that certain learning styles were clearly favored over others. For example, in most educational settings, students were required to work independently on different cognitive tasks; new concepts and rules were introduced verbally in linear sequence; the main medium of instruction was written or spoken words, and the evaluation of student achievement was also verbal and written. Certainly, school instruction does not favor the kinesthetic student who may be a group learner (*Research Monograph #5. Journal and Research Articles on Learning Styles and Teaching Strategies*, Hanson Silver Strong and Associates). The perceptual styles of poor readers were tactile-kinesthetic (Murray, 1980). Rita and Ken Dunn confirm that tactile-kinesthetics face the most learning difficulties in schools. Ninety-five percent of these learners are male and are usually considered hyperactive (*The Learning Revolution*, Dryden and Vos, 1994).

Hypothesis: Hourly workers will have learning styles that differ from those of managers. The primary learning style of workers will be AVK (auditory/visual/kinesthetic) while that of the managers will be visual/linguistic.

Background Information: During the course of a National Literacy Grant, the instructors and project director became interested in the communication and learning styles of the front-line workers they were serving. Workers served were those who were attending workshops or classes, who had consulted with the instructors for help with a basic skills problem at work, who wanted information on their educational levels, and who were interested in pursuing higher education or enrolling in basic literacy classes. During discussions with workers, the grant staff found that many of the workers were self-critical about their basic skills, expressing frustration with their earlier school years. Often they blamed themselves, rather than the instruction they had received, as the reason for their failure. This group mentioned disliking school and many dropped out. Those who stayed in school did so just to attain a diploma, and thus did not benefit from the educational process. Many of them had gone straight from the school house door to the factory floor and had trained on the job for their positions. From the viewpoint of the instructors, the use of a learning styles survey would help the instructors choose a learning approach that met the individual's style preference and strengths and not be a repetition of an instructional approach that did not work during their school years. The learning styles survey could also be used as a recruiting tool for classes, suggesting to workers that the reason they had not done well in school could have been due to instructional strategies that did not match their learning styles. After many years of hearing front-line workers complain about their early school years, the project director wanted to know if perhaps the learning styles used in the K-12 years emphasized linguistic strengths and workers were Audio/Visual/Kinesthetic. Since management and most of the supervisors (other than first-line or promoted through the ranks) had obtained college degrees, it was hypothesized that they would be visual or linguistic learners.

The purpose for pursuing the research was fourfold:

1. ***to serve as a recruitment tool***
   - -dispel fear of learning
   - -promote self-confidence
   - -learn more about oneself as a learner

2. ***to improve communication in the workplace***
   - -awareness of different communication styles
     - -workers to supervisors
     - -supervisors to workers

3. ***to plan for classes***
   - -instructional strategies
   - -content of curriculum

4. *to increase instructors' success*
   -make instructors aware of their personal learning modalities and how that influences their teaching styles
   -encourage instructors to vary instructional approaches in their classes

Procedures used to collect information: Students in the classes and workshops were strongly encouraged to take the C.I.T.E. In order to increase understanding of the individual worker and to improve communications between work teams, some departments required their workers to take the survey. The C.I.T.E. measured whether students were Visual, Linguistic, Auditory, or a combination of Auditory/Visual/Kinesthetic (AVK). Their communication style (oral or written) and their social learning style (individual or group). Other workers in the plant were given the C.I.T.E. as part of workshops on communication, teamwork, and conflict resolution. Supervisors and some workers were given the survey at team meetings with follow-up provided by the on-site instructor.

Description of the instrument: The C.I.T.E. is a learning styles survey developed by the Center for Innovative Teaching Techniques, Wichita Public Schools, Wichita, Kansas, and was used with its permission. The grant staff felt that some of the questions needed to be rephrased, as they were intended for school children and did not reflect the atmosphere of the workplace. The question content was not changed, only the wording in order to reflect work-related content. The C.I.T.E. is concerned with physical stimuli as described by Dunn and Dunn in their research. Physical Stimuli contain modality preferences--auditory, visual, or kinesthetic, which are used to determine instructional preferences. Definitions of the learning styles identified by the survey are as follows:

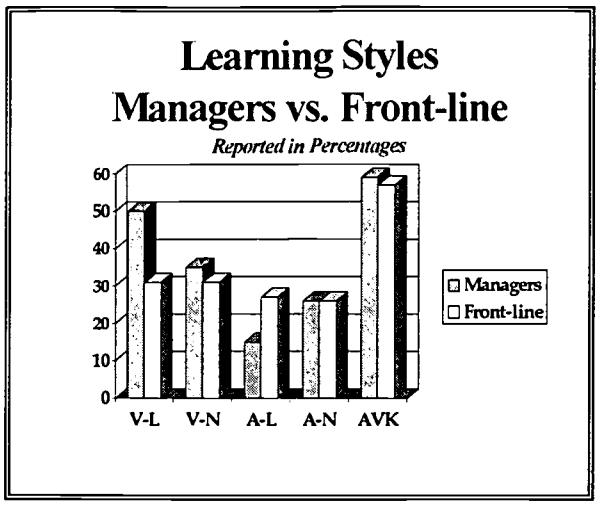
- ***Visual***-tends to respond to new information in a visual or pictorial fashion. Learns best through pictures, filmstrips, graphs, drawings, books, magazines, or demonstrations.
  - Visual Linguistic (V-L) students learn best from seeing words in print.
  - Visual Numeric (V-N) students must see numbers in order to work with them.
- ***Auditory***-responds to new information in an auditory or listening fashion. Learns best through use of tapes, lectures, discussions, records, oral directions, and explanations.
  - Auditory Linguistic (A-L) students learn best from hearing the spoken word.
  - Auditory Numeric (A-N) students learn best from hearing numbers and oral explanations.
- ***AVK combination***-ability to acquire meaning through the senses of touch and movement. Used with auditory and visual senses--learns best by manipulation of material. Doers would rather do something first and read about it later (Dunn and Dunn, 1993).

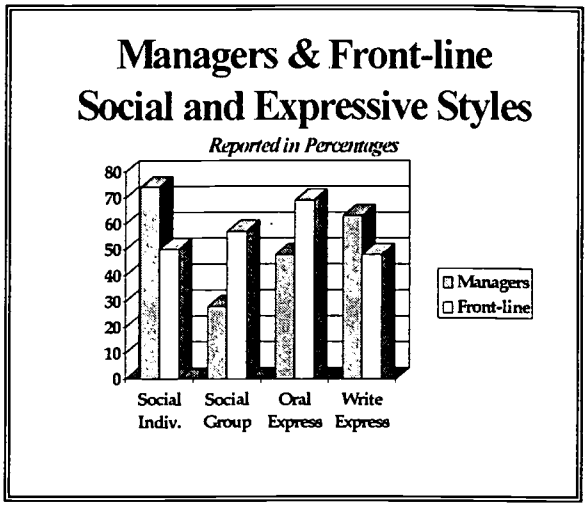
Follow-up to the survey: Workers taking the survey received copies of their score reports either in person or by mail. The score reporting was followed by explanation during classes or workshops, personal counseling sessions, or in learning styles workshops conducted after the survey was given.

The results: Fifty-three percent (53%) of hourly workers were auditory/visual/kinesthetic, which is double that of the general population as described by Barbe and Milone in their research. Forty-five percent (45%) have additional modality strengths. However, fifty-eight percent (58%) of supervisors and managers were also AVK. Sixty nine percent (69%) of the Managers/supervisors had two or more modality strengths. Managers were twice as likely as front-line workers to be visual linguistic, which research has shown to be the dominant teaching style used in K-12 schooling. Although the managers and supervisors preferred kinesthetic learning, they did respond to visual and auditory stimuli and could also learn through those options. Many of the managers/supervisors had degrees in chemical and electrical engineering--both areas which require extensive hands-on or kinesthetic activities. Perhaps they had chosen AVK occupations which required them to use those hands-on skills in an industrial setting. In addition:

- While managers tended to be individual (73%) learners, hourly workers were group learners(58%).
- Managers tended to be written expressive(62%) while front-line workers were oral-expressive(68%).

The following graphs illustrate the differences between the learning, communication, and social styles of the front-line worker versus the manager:





(*Explanation of Learning Styles Abbreviations:* V-L = Visual Linguistic, V-N = Visual Numerical, A-L = Auditory Linguistic, A-N = Auditory Numerical, AVK = Auditory Visual Linguistic)

How useful are the results? Knowing that front-line workers are highly AVK, group learners, and oral expressive is highly useful information to workplace education providers and industry trainers, as well as to educators in general. The research points out how essential it is to be aware of students' differences when preparing educational materials. Although a majority of front-line workers are AVK (54%), oral (70%), and group (57%), classes need to include instructional activities for **all** learning styles. Learners' failures may have more to do with how they are taught, than with their perceived learning deficiencies. Being more aware of students' learning styles changed the way our staff developed the curriculum. In developing a basic electricity class for workers, we emphasized hands-on activities as a way to understand electrical theory. Rather than having the students study theory first, they learned by performing experiments under the careful eye of the instructor and relating theories learned to how electricity was used in the plant.

Students must become cognizant that they need to work on those modalities in which they are weaker. If the job requires them to write detailed reports and analyze graphs and charts, they are encouraged to use their strengths and preference of group learning to increase those visual linguistic skills.

Discussion of different learning styles generated interest in our workplace basic skills classes and brought more learners to our instructors for educational counseling. In fact, at one workplace site, 109 workers contacted the instructor for educational counseling. At their request, learning styles inventories were given to workers to take home and use with family members. Learning styles workshops were also responsible for increasing workers' communication between members of their work teams as well as with their supervisors. Supervisors and front-line workers frequently commented on better understanding their fellow workers. They showed an understanding of why they had previously had problems communicating at work.

Resources

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Dunn, Rita and Dunn, Ken, *Teaching Secondary Students Through their Individual Learning Styles.* Allyn and Bacon, Boston, 1993.

Hanson, Silver, Strong & Associates. *Research Monograph #5. Journal and Research Articles on Learning Styles and Teaching Strategies.*

Integrated Learning: Multiple Gateways for Lifetime Learning, in a presentation for learning materials.

Keefe, 1987, as quoted in "Making Sense of Style" by John O'Neil. *Educational Leadership*, October, 1990, p. 5.

Murray, C.A. (1990) "The Comparison of Learning Styles Between Low and High Reading Achievement Subjects in the Seventh and Eighth Grades in a Public Middle School." Doctoral Dissertation, US International University, 1980. Dissertation Abstracts International, 41, 1005

The Learning Styles Network Newsletter. Winter, 1980.

Products created by the grant staff:

- the C.I.T.E. for workplace use (adapted by the grant staff)
- revised scoring sheet and grid
- a Group Profile Sheet for use with large or small groups
- a workshop on Learning Styles

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